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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Chentsau Ying et al.

SERIAL NO.: 09/991,166

FILED: November 16, 2001

FOR: METHOD OF REDUCING PARTICULATES
IN A METAL ETCH CHAMBER
DURING A METAL ETCH PROCESS

§ GROUP ART UNIT: 1765

§

§ EXAMINER: L. Vinh

§

§

§

§

§ Attorney Docket No.:

§ AM-5630.P1

Date: March 18, 2004

DECLARATION OF PRIOR INVENTION UNDER 37 CFR § 1.131

Hon. Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

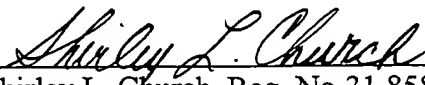
This Declaration under 37 CFR § 1.131 accompanies Amendment "A", which is in response to the Office Action mailed November 5, 2003.

We, Yong Deuk Ko, Se Jin Oh, Chang Ouk Jung, Jeng H. Hwang, and Chentsau Ying, hereby declare that we are joint inventors of the invention claimed in U.S. Patent Application Serial No. 09/991,166. We further declare that said invention was conceived and reduced to practice by us prior to May 30, 2001, which is the filing date of U.S. Patent No. 6,559,001 B2, which issued on May 6, 2003.

CERTIFICATE OF MAILING UNDER 37 CFR 1.10

I hereby certify that this paper and any documents said to accompany this paper are being deposited with the U.S. Postal Service on the date shown below with sufficient postage as U.S. EXPRESS MAIL NO. ER534273792US in an envelope addressed to : Mail Stop Amendment (With Fee), Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

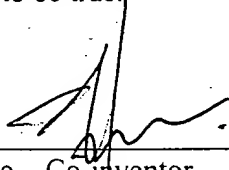
Date: March 18, 2004


Shirley L. Church, Reg. No. 31,858

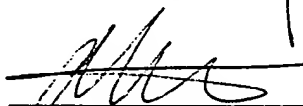
In support of our Declaration, attached is a copy of the Invention Alert which preceded the present patent application. This Invention Alert shows that the invention claimed in the present application was conceived and reduced to practice by us prior to November 21, 2000. Portions of the Invention Alert which pertain to conclusory dates of invention have been dedacted to protect the rights of the inventors.

We, the undersigned, being warned that willful false statements and the like are punishable by fine or imprisonment, or both, under Sec. 1001 of Title 18 of the United States Code, and further that such willful false statements and the like may jeopardize the validity of the application or document or any registration resulting therefrom, such as a patent issued thereon; and, each declarant declares that all statements made of his/her own knowledge are true; and that all statements made on information and belief are believed to be true.


1) Nov. 8, 2004


Yong Deuk Ko, Co-inventor

2) Mar. 8, 2004


Se Jin Oh, Co-inventor

3) Mar. 8, 2004


Chan Ouk Jung, Co-inventor

4) _____, 2004

Jeng H. Hwang, Co-inventor

5) _____, 2004

Chentsau Ying Co-inventor

INVENTION ALERT FORM

REC'D NOV 27 2000

0005714

TO: Gaile Bailey

M/S 2061

ALERT NO:

Extension:

32724

Current Date:

NOV. 21, 2000

→ 5630PI

CIRCLE ONLY ONE APPLICABLE DIVISION AND PRODUCT BUSINESS GROUP(PBG)
PLEASE SUBMIT ONE ORIGINAL, SIGNED DOCUMENT FOR RECORDING. IF THIS IS A
COPY OF A PREVIOUSLY SUBMITTED ALERT, PLEASE MARK IT ACCORDINGLY

EPI	PDD	ETCH	ATD	IBSS	CORE	PRP	MD	AKU	PDC	SOFTWARE
EPI	KPU1	METAL	ATD	IBSS	CORE TEC	PRP	PVD	ACVD	OPAL	AMIL
HTF	KPU2	SILICON	CORP		PSI		KPU5	APVD	ORBOT	AMI
RTP	KPU3	HDP			CORE ENG		KPU6	AETCH		
AIT	KPU8	MXP&RPS			PROCOMP		INTE	AHRDWR		
	CTO	COM ENG			CORE KNO					
	CMP	HEXODE			MICRO					

*Metal Deposition

Please use separate attachments for any answers that don't fit on the form, especially for questions 3-8. If the answer to a question is "NONE", please write "NONE" rather than leaving the answer blank.

1. Title of Invention (please print clearly):

SEASONING METHODS IN HIGH-TEMPERATURE CATHODE DPS
CHAMBER FOR ETCHING FERAM MATERIALS INCLUDING
In Pt, PZT, IrO₂ TO AVOID PARTICLES DEFECT.

2. Inventors-Names only-(please print clearly and provide complete information at Section 9.)

CHENTSAN (CHRIS) YING
(JAY) JENG H. HUANG

NOV 27 2000
RECEIVED
CENTRAL INTELLIGENCE

3. Earliest dates and model names of all Applied products incorporating the invention which have been offered for sale or are expected to be offered for sale:

METAL ETCH DPS CENTURA SYSTEM.

4. If the invention has been demonstrated or described to persons other than Applied employees, for each disclosure please provide the earliest date, name of company, a brief description of what was disclosed and the purpose of the disclosure. Attach a copy of any related non-disclosure agreements:

[REDACTED]

5. If future disclosures like those in Question #4 are expected to occur within the next 12 months, please provide the anticipated date, type of information to be disclosed, and purpose of the disclosure: NONE []

THE SEASONING PROCEDURE WILL BE DISCLOSED TO ALL
HIGH-TEMP DPS CUSTOMERS WHICH INCLUDE (PROTECTOR)

[REDACTED]

THE PURPOSE OF DISCLOSURE IS FOR PARTICLE PREVENTION
AT INITIAL BAKE.

6. Describe any other known designs or processes, whether actually implemented or merely proposed in a publication, which could be considered similar to your invention or which constitute the state-of-the-art improved upon by your invention: If described in a publication, attach a copy of same or provide a citation.

NONE.

7. List each feature of the invention which you consider novel and non-obvious. Describe the advantages of each novel feature in comparison with the state-of-the-art approaches which are most similar to your invention:

- ① HIGH Cl_2 FLOW IN THE SEASONING CHEMISTRY ASSOCIATED WITH N_2 AND Ar GASES.
- ② SiO_2 WAFER USED AS DUMMY WAFERS
- ③ HIGH CATHODE TEMPERATURE USED ($7300^\circ C$)
- ④ THE SEASONING RECIPE IS DIFFERENT FROM THE ETCHING RECIPE, WHICH IS CONTRARY TO COMMON PRACTICE.

8. Describe the invention, preferably with reference to attached drawings:

- ① THE INVENTION INVOLVED USING THE FOLLOWING RECIPE:
 $120 Cl_2 / 30 Ar / 15 N_2 / 20 MT / 275 W_0 / 900 W_s / T_c = 350^\circ C / H_0 = 2T$
TO SEASON THE HIGH-TEMP CATHODE DPS CHAMBER.
THE CHAMBER WAS USED TO ETCH FORAM MATERIALS SUCH AS Ir, IrO₂, Pt & Pt.
- ② SiO_2 WAFERS WERE USED AS DUMMY DURING PLASMA SEASONING FOR THE FOLLOWING TWO EFFECTS:
1) THE METAL/METAL OXIDE PARTICLES CREATED BY ETCHING Ir FOR EXAMPLE COULD REACT WITH Cl_2 -RICH PLASMA IN THE HIGH TEMPERATURE ENVIRONMENT.
2) SiO_2 ETCH BY-PRODUCT USING $Cl_2/N_2/Ar$ CHEMISTRY COULD FORM A STICKY LAYER ON THE INTERIOR SURFACE OF THE CHAMBER INCLUDING DOME CAPTURE RING, AND CHAMBER WALL. THIS PREVENTING ANY METAL/METAL COMPOUND PARTICLES TO FLAKE OFF CREATING DEFECTS.
- ③ THE RECIPE SHOULD BE USED FOR 30 min RF TIME AFTER CHAMBER WET CLEAN OR 4 MINUTES RF TIME AFTER LONG ATTACH ADDITIONAL SHEETS TO DESCRIBE INVENTION AS NEEDED
CHAMBER IDLE TIME UNDER VACUUM.
- ④ DEMONSTRATION AT [REDACTED] HAD SHOWN THAT PARTICLE COUNT DROPPED FROM >100 TO <20 ADDERS.

9. Provide the following information for EACH inventor.

Inventor #1:	
Name:	<u>CHEN TSAU (CHRIS) YING</u> Employee # <u>72961</u> Mail Stop <u>81330</u>
Work Phone	<u>408-584-2107</u> Fax No.: <u>408-584-2660</u>
Job Title:	<u>PROCESS MTS</u>
Citizenship	<u>US</u>
Home Address	<u>10370 N. BLANEY AVE CUPERTINO, CA 95014</u>
Manager:	<u>JENG H. HWANG</u> Title: <u>SR. TECHNOLOGY MANAGER</u>
Div. Manager	<u>RALPH KERNS</u> Title: <u>GM</u>
Product Group:	<u>ETCH</u> Dept #: <u>881</u>

Inventor #2:	
Name:	<u>(JAY) JENG H. HWANG</u> Employee # <u>47381</u> Mail Stop <u>81330</u>
Work Phone	<u>408-584-2109</u> Fax No.: <u>408-584-2660</u>
Job Title:	<u>SR. TECHNOLOGY MANAGER</u>
Citizenship:	<u>US</u>
Home Address	<u>20835 SCOTFIELD DR. CUPERTINO, CA 95014</u>
Manager:	<u>STEVE MAK</u> Title: <u>SR. TECHNOLOGY DIRECTOR</u>
Div. Manager	<u>RALPH KERNS</u> Title: <u>GM</u>
Product Group:	<u>ETCH</u> Dept #: <u>881</u>

Inventor #3:	
Name:	Employee # _____ Mail Stop _____
Work Phone	Fax No: _____
Job Title:	_____
Citizenship:	_____
Home Address:	_____
Manager	Title: _____
Div. Manager	Title: _____
Product Group:	Dept #: _____

FOR ADDITIONAL INVENTORS, PLEASE COMPLETE AND ATTACH ADDITIONAL SHEET AS NEEDED.

10. Signature, date and PRINTED name of each inventor plus witnesses who have read and understood this invention Alert form:

Inventors:

CHEN PAU YING 11/21/00
Printed Name Date

CHEN PAU YING
Signature

TENG H. HAIWONG 11/21/00
Printed Name Date

TENG H. HAIWONG
Signature

Printed Name

Date

Signature

Printed Name

Date

Signature

Printed Name

Date

Signature

Printed Name

Date

Signature

Witness:

Li Lu 11/21/00
Printed Name Date

Li Lu
Signature

Hong Shih 11/22/00
Printed Name Date

Hong Shih
Signature

Return to: Gaile Bailey
Mail Stop: 2061
Fax No...: 986-3090
Extension: 563-2724



UNITED STATES PATENT AND TRADEMARK OFFICE

REC'D APR 14 2004

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,166	11/16/2001	Chentau Ying	05630 USA P 01/ETCH/METAL	3830
32588	7590	04/08/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			VINH, LAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 04/08/2004

NCA 5.8

Please find below and/or attached an Office communication concerning this application or proceeding.

COMPUTER ENTERED

APR 14 2004



UNITED STATES PATENT AND TRADEMARK OFFICE

09/99/166
 UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
 DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
 WASHINGTON, DC 20231
 www.uspto.gov

Paper No.

Notice of Non-Compliant Amendment (37 CFR 1.121)

The amendment document filed on 3/18/04 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121, as amended on June 30, 2003 (see 68 Fed. Reg. 38611, Jun. 30, 2003). In order for the amendment document to be compliant, correction of the following omission(s) or provision is required. Only the section (1.121(h)) of the amendment document containing the omission or non-compliant provision must be resubmitted (in its entirety), e.g., the entire "Amendments to the claims" section of applicant's amendment document must be re-submitted.

THE FOLLOWING CHECKED (X) ELEMENTS(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
- ☐ A. Amended paragraph(s) do not include markings.
 - ☐ B. New paragraph(s) should not be underlined.
 - ☐ C. Other _____
- ☐ 2. Abstract:
- ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
 - ☐ B. Other _____
- ☐ 3. Amendments to the drawings: _____
- ☒ 4. Amendments to the claims:
- ☐ A. A complete listing of all of the claims is not present.
 - ☒ B. The listing of claims does not include the text of all claims (incl. withdrawn claims)
 - ☐ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified.
 - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
 - ☐ E. Other: Claim 31 should not be there.

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP Sec. 714 and the USPTO website at <http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/officesflyer.pdf>.

If the non-compliant amendment is a **PRELIMINARY AMENDMENT**, applicant is given **ONE MONTH** from the mail date of this letter to supply the corrected section which complies with 37 CFR 1.121. Failure to comply with 37 CFR 1.121 will result in non-entry of the preliminary amendment and examination on the merits will commence without consideration of the proposed changes in the preliminary amendment(s). This notice is not an action under 35 U.S.C. 132, and this **ONE MONTH** time limit is not extendable.

If the non-compliant amendment is a reply to a **NON-FINAL OFFICE ACTION**, and since the amendment appears to be a *bona fide* attempt to be a reply (37 CFR 1.135(c)), applicant is given a **TIME PERIOD** of **ONE MONTH** from the mailing of this notice within which to re-submit the corrected section which complies with 37 CFR 1.121 in order to avoid abandonment. **EXTENSIONS OF THIS TIME PERIOD ARE AVAILABLE UNDER 37 CFR 1.136(a).**

If the amendment is a reply to a **FINAL REJECTION**, this form may be an attachment to an Advisory Action. The period for response to a final rejection continues to run from the date set in the final rejection, and is not affected by the non-compliant status of the amendment.

[Signature]
 Legal Instruments Examiner (LIE)